Application for Permit for Scientific Purposes under the Endangered Species Act

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Contents

A. Title

Application for Permit for Scientific Purposes under the Endangered Species Act of 1973.

B. Species

Chinook salmon (*Oncorhynchus tshawytcha*) Puget Sound ESU

C. Date of Permit Application

January 26, 2006
Study duration: 2006 – 2010 (5 years)

D. Applicant Identity

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E. Information on Personnel, Cooperators, and Sponsors

Principal Investigators and Field Supervisors

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Field Personnel

Megan Hilgart, Hazel Galang, Andy Nicholls, Andy Sorter, Jina Chan

Funding Sources/Sponsors

Commencement Bay Natural Resource Trustees
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Disposition of Dead Specimens (tissues)

N/A

Transport and Long-term Holding

N/A

F. Project Description, Purpose, and Significance

The National Oceanic and Atmospheric Administration (NOAA) is the lead agency of the Commencement Bay Natural Resource Trustees (Trustees[1]) and is responsible for managing restoration projects under the Commencement Bay Natural Resource Damage Assessment and Restoration program. Restoration sites include salt marsh, off-channel, and riparian buffer habitat that benefit juvenile salmonids and other species. The restoration sites provide habitat for juvenile salmonids by increasing areas for rearing and foraging, as well as enhancing conditions for important prey resources such as forage fish and terrestrial insects. The restoration sites are intended to provide rearing and foraging habitat and a migratory corridor in the Commencement Bay area. Since high quality habitats are rare throughout the Commencement Bay area, restoring the area is important for the overall health and function of the Bay's ecosystems. Of particular importance is the improvement of habitat for Chinook salmon (*Oncorhynchus tshawytcha*) because they are listed as threatened in Puget Sound under the federal Endangered Species Act (ESA). The restoration sites are on historical and modern salmonid outmigration routes (Graeber, 1999, as cited in Simenstad, 2000).

In 2000, the Trustees prepared a Restoration Monitoring Plan for Commencement Bay in order to measure the success of restoration efforts, identify adaptive management approaches if projects are not achieving goals, address monitoring requirements specified by permitting agencies, and serve as an outreach tool to disseminate project information to interested parties (Trustees, 2001). The monitoring plan describes a 10-year program of physical and biological studies to evaluate the structure and function of the restoration sites. Fish monitoring is an important component of the monitoring plan and was conducted at six sites in

[1] The Commencement Bay Natural Resource Trustees consist of the following entities: the National Oceanic and Atmospheric Administration; the U.S. Fish and Wildlife Service; the Puyallup Tribe of Indians; the Muckleshoot Indian Tribe; the Washington State Department of Ecology; the Washington State Department of Fish and Wildlife; and the Washington State Department of Natural Resources.

2002, 2003, and 2004. The first year of fish monitoring was led by National Marine Fisheries (NMFS) staff with assistance from RIDOLFI Inc. (Ridolfi) staff. In 2003 and 2004, Ridolfi staff led the fish monitoring effort, which was conducted under a NMFS ESA permit. The work described in this application is for years 5 through 10 of the Trustees monitoring program (2005, the fourth year was skipped intentionally).

The Puyallup River basin supports wild and hatchery Chinook, coho, chum, and pink salmon, as well as steelhead, sea-run cutthroat, and bull trout/Dolly Varden. The Puyallup Tribe, Muckleshoot Tribe, and Washington Department of Fish and Wildlife have hatcheries in the basin that produce spring/fall Chinook, coho, and steelhead. Out-migration occurs from March through July, with peak use of the nearshore tidal areas occurring May through June.

Juvenile Chinook salmon require estuarine and nearshore marine habitat for migration, foraging, refuge, and osmoregulation processes (physiological transition to saltwater). Juveniles spend from several days to months in estuarine habitat before migrating into marine waters (Kerwin, 1999). Juveniles rely on shallow nearshore habitats such as eelgrass meadows, intertidal flats, tidal marshes, and subtidal channels near estuaries (Steelquist, 1992). Juveniles prey on a wide variety of food such as benthic, epibenthic, and pelagic crustaceans, as well as insects, fish larva, and juvenile fish. Adult salmon feed on forage fish such as surf smelt, longfin smelt, Pacific sandlance and herring while in the estuarine and marine environment.

Commencement Bay provides nearshore marine and estuarine habitat for adult and juvenile Chinook salmon as well as the resident "blackmouth" population of Puget Sound. "Blackmouth" are Chinook that spend their entire life cycle in Puget Sound and do not migrate to the open ocean. Commencement Bay also provide habitat for adult and juvenile salmon migrating to and from rivers in south Puget Sound.

The Puyallup River delta and Commencement Bay provide habitat for adult migration, juvenile migration and rearing, and transition zones for both adults and juveniles. Juvenile Chinook outmigration from the Puyallup River occurs from mid-April through mid-July. Juvenile chinook salmon rear in Commencement Bay during the months of May and June (Simenstad, 2000). During previous years' fish monitoring conducted by Ridolfi for the Trustees, peak numbers of juvenile Chinook salmon were observed in the nearshore habitat of Commencement Bay during the month of May; peak catches of juvenile chinook salmon occurred in late May (Ridolfi, 2003 and 2004).

The focus of this study is to monitor fish access, presence/abundance, and species composition at habitat restoration sites throughout Commencement Bay and its tributaries for years 5, 7, and 10 of the monitoring plan (2006 through 2010). The primary species targeted in the study will be juvenile outmigrating salmonids, with emphasis on Puget Sound Evolutionarily Significant Unit (ESU) Chinook

salmon (*Oncorhynchus tshawytscha*). Data from the project will be used to determine the overall success of the habitat restoration sites and identify any adaptive management necessary to ensure the habitat restoration sites continue to function properly. Data from the project will provide information such as presence/abundance and growth of wild versus hatchery salmonids at the habitat restoration sites, as well as provide information on the presence/abundance and composition of salmonids, forage fish, flat fish, and resident fish species in south Puget Sound.

G. Project Methodology

A four-person crew will use block nets and beach seine nets to sample fish at six restoration sites throughout Commencement Bay and its tributaries- other sites may be monitored in later years of the program as additional restoration work is completed. The fieldwork will be conducted according to the schedule outlined in the Restoration Monitoring Program (Trustees, 2001). The crew will collect, identify, and measure the fork length (FL) of salmonids to the nearest millimeter (mm). If possible, hatchery fish will be identified by the presence of clipped fins or coded wire tags (CWTs). The fish will be released immediately after examination. In the event of large catches a subset of the catch will immediately be placed in aerated tanks to be sampled. The rest of the catch will be identified, counted, and immediately released to ensure the survival of fragile juvenile salmonids and other species. All personnel involved in the project have experience capturing and handling fish. All fish will be sampled and released in a timely and appropriate manner in order to minimize stress. During capture, handling, and release fish may experience scale loss, abrasion, internal injury, and stress. Every effort will be made to minimize injury or mortality to the species involved.

Sampling will be conducted beginning in early February and ending in August. Sampling will be conducted every other week in February, March, July and August, and weekly in April, May, and June. Approximately 30 sampling events comprising 230 sets will occur annually.

Block Nets

Block netting is the preferred method to sample the Mowitch site because of the site configuration- there are three tidal pools with relatively narrow entrances. Block nets are positioned across the entrance to each pool during high tide and fish are collected when the tide recedes. A 16-ft (5-m) outboard skiff will be used to set block nets made of 0.4 inch (in.) (1 centimeter [cm]) mesh measuring 120-ft x 44-ft (37-m x 13.5-m). Each block net will be attached to a length of rebar driven into the shore on either side of the mouth of the pool to be fished to ensure full blockage of the outlet. The nets will be set during tide cycles that include an 8 ft (2.4 m) or greater high tide and a 0 ft (0 m) or lower low tide. The nets will be allowed to "soak" as the tide recedes, until the pools are emptied of water,

which takes approximately three to four hours. Sampling personnel will monitor the nets as low tide approaches to ensure the catch will not be left without water.

As the tide recedes, all fish will be collected from the nets, identified by genus and species, counted, examined for external anomalies, and released. Additionally, up to 30 specimens from each species of salmonids, sculpin, flat fish, and forage fish will be measured before being released. Salmonid fork lengths will be measured to the nearest mm (from nose to mid-fork of tail); all other species will be measured full length to the nearest mm (from nose to end of tail).

Salmonids will also be checked for hatchery marks. These data will be used to estimate the proportion of wild to hatchery fish, as well as the hatchery origin of marked fish. Possible hatchery marks include adipose fin clips, right ventral fin clips, left ventral fin clips, and CWTs. Sampling personnel will examine salmonids for fin clips while the fish are being measured and identified. Tags will be detected using a handheld CWT wand detector. Hatchery fish examined will be assumed to originate from the Washington State and tribal hatcheries located in the Puyallup River basin.

Beach Seine Nets

At sites allowing the use of beach seine nets, a skiff will be used to deploy a 120-ft x 8-ft (37-m x 2.4-m) floating "Puget Sound" beach seine net of 0.4 in. (1 cm) mesh. The main part of the beach seine, known as the "wings," is constructed with 1 in. (2.5 cm) mesh. In between both wings is a "bag" made of 0.25-inch (0.6-cm) mesh and 6 ft (1.8 m) in depth. Attached to each end of the beach seine at the cork line is approximately 50 ft (15 m) of polypropylene line (poly-line), which is used to pull the net to shore.

Captured fish will identified, measured, and counted as described for the block net sampling method. Replicate sets will be made at each site if space, time, and tide stage permits. Care will be taken to ensure that the area covered by one set is not duplicated in the replicate sets. This will be achieved by moving approximately 10 to 20 ft (3 to 6 m) away from the previous set's endpoint. Generally, three sets will deployed at each site. Time between sets will vary between five and 30 minutes, a reflection of the time needed to process fish caught in a set. Beach seining will be conducted during high to mid-tide, generally on an outgoing tide.

For all sampling events, the following data will be collected at each site: location, date, time, tide stage (time and height), and weather conditions, including an approximation of air temperature, wind direction, precipitation, and cloud cover. The time at which each set is deployed will also be recorded.

Environmental measurements taken at each site will include water quality parameters such as temperature and salinity. A YSI 30 salinity-conductivity-

temperature (SCT) meter will be used to collect water quality data. Any uncommon events or changes in the sites will be noted.

All data will be entered into an Excel spreadsheet by Ridolfi personnel. Salmon numbers will be adjusted by catch per unit effort (CPUE), and salmon mean average lengths will be used in the data analysis. The data will be analyzed using Delta Graph 5 software. At the end of each sampling season an annual monitoring report will be prepared for the Trustees. A copy of the data will also be provided to appropriate agencies, as required by permit.

H. Description and Estimates of Take

Puyallup/White River Chinook are a mix of hatchery-reared Chinook, naturally producing Chinook originating from a hatchery, and wild Chinook. Wild Chinook from the system are considered "ocean type" fish because they spend a short amount of time rearing in fresh water after emergence.

Chinook salmon in the Puyallup River basin comprise three stocks: the Puyallup River Chinook, the White River (Puyallup) spring Chinook, and the White River (Puyallup) fall Chinook. According to the *WDFW Salmonid Stock Inventory Report for 2002*, the status of the Puyallup River and White River (Puyallup) fall Chinook is unknown, while the status of the White River (Puyallup) spring Chinook is critical (WDFW, 2002). More information on current status and trends for the Puget Sound salmon ESU and Puyallup River basin are also available in the *Draft Puget Sound Salmon Recovery Plan* (SSDC, 2005).

This project is targeting wild and hatchery produced juvenile Chinook salmon (*Oncorhynchus tshawytscha*). All juvenile Chinook salmon encountered during the project are assumed to be listed, we believe this is a conservative approach. As shown in Table 1, 613 juvenile Chinook salmon from Commencement Bay and its tributaries are expected to be sampled annually during this research project. These numbers are the exact numbers of juvenile Chinook salmon sampled during the Year 3 monitoring season conducted at the habitat restoration sites in Commencement Bay. All data from the Year 3 monitoring effort are available in the *Year 3 (2004) Monitoring Report for Commencement Bay Habitat Restoration Sites* (Ridolfi, 2004).

To our knowledge, no studies have been conducted on mortality rates of salmonid; as a result of capture, handling, and release, during beach seine and block net sampling projects. We assumed a 3% mortality of salmon caught and released based upon our past experience and consultations with other fisheries scientists doing similar work in the region. As shown in Table 1, we are requesting authorization for the unintentional mortality of 18 juvenile Chinook salmon annually throughout the course of this research project. The estimated unintentional mortality numbers allow for any delayed mortalities that occur after release.

Table 1. Estimated annual take and mortality for the listed ESU Puget Sound juvenile Chinook salmon(*Oncorhynchus tshawytscha*) for 2006-2010.

ESU/Species	Origin	Life Stage	Take Activity	Requested Number Fish to be Taken	Requested Authorized Unintentional Mortality	Research Location	Research Period
Puget Sound Chinook salmon	wild	Juvenile	Capture, handle, release	76	2	Commencement Bay and Tributaries	March - August
Puget Sound Chinook salmon	hatchery	Juvenile	Capture, handle, release	480	14	Commencement Bay and Tributaries	March - August
Puget Sound Chinook salmon	unknown	Juvenile	Capture, handle, release	57	2	Commencement Bay and Tributaries	March - August
Total Chinook				**613**	**18**		

I. Transportation and Holding

Listed fish will not be transported or held live in the course of this project.

J. Cooperative Breeding Program

We are willing to participate in a cooperative breeding program and to maintain or contribute data to a breeding program, if such action is requested.

K. Previous or Concurrent Activities Involving Listed Species

Although the principal investigator, Sherrie Duncan, has not held ESA permits in the past, she has supervised and participated in numerous fisheries research projects for 14 years. She was field supervisor of Commencement Bay fish monitoring efforts in 2003 and 2004. Colin Wagoner managed the monitoring efforts in Commencement Bay in 2002, 2003, and 2004. Field staff proposed for the current project participated in the prior monitoring events. Please see attached resume for Sherrie Duncan, Principal Investigator/Field Supervisor.

L. Certification

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand this information is submitted for the purpose of obtaining a permit under the Endangered Species Act of 1973 (ESA) and regulations promulgated thereunder, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or to penalties under the ESA."

Signature _____ Date 1/26/2006

Colin Wagoner, Principal Engineer

M. Length of Time and Cost to Prepare Application

The application was completed in approximately 24 hours. The time was significantly reduced by incorporating relevants sections from other available documents. The cost of preparing the document was approximately $50.00

N. References

Commencement Bay Natural Resource Damage Assessment and Restoration Trustees (Trustees). 1997. Commencement Bay Natural Resource Damage Assessment Restoration Plan. June. Available at: http://www.darp.noaa.gov/northwest/cbay/pdf/restplan.pdf.

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RIDOLFI Inc. (Ridolfi). 2003. Year 2 (2003) Monitoring Report for Commencement Bay Habitat Restoration Sites. Prepared for the Commencement Bay Natural Resource Damage Assessment and Restoration Trustees. December.

RIDOLFI Inc. (Ridolfi). 2004. Year 3 (2004) Monitoring Report for Commencement Bay Habitat Restoration Sites. Prepared for the Commencement Bay Natural Resource Damage Assessment and Restoration Trustees. January.

Steelquist, R. 1992. Field Guide to the Pacific Salmon. Sasquatch Books, Seattle, Washington.

Shared Strategy Development Committee (SSDC). 2005. Draft Puget Sound Salmon Recovery Plan, Volume 1, June 30, 2005-Revised December 2005. December. Available: http://www.sharedsalmonstrategy.org/plan/toc.htm

Simenstad, C. 2000. Commencement Bay Aquatic Ecosystem Assessment: Ecosystem-scale Restoration for Juvenile Salmon Recovery. SoF-UW-2003, School of Fisheries, University of Washington. Prepared for City of Tacoma, Washington Department of Natural Resources, and U.S. Environmental Protection Agency. May. Available: http://www.fish.washington.edu/research/publications/pdfs/2003.pdf.

Washington Department of Fish and Wildlife (WDFW). 2002. Salmonid Stock Inventory (SaSI) 2002: WRIA 10-Puyallup. Available: http://wdfw.wa.gov/fish/sasi/.

Resume for Sherrie Duncan Principal Investigator and Field Supervisor

Sherrie has fourteen years of experience handling fish for numerous fisheries research projects. For eleven years, Sherrie served as the field supervisor and technician in the Sportfish Division of the Alaska Department of Fish and Game, Haines, Alaska. She was involved in field research and data collection at remote rivers in southeast Alaska, with focus on the life cycles of wild Chinook and coho salmon. Sherrie has supervised and participated in numerous coded wire tagging projects, mark and recapture projects, and test fishery projects throughout southeast Alaska. These projects involved various trapping and tagging methods, species identification, data collection, data entry, budgeting and purchasing, scheduling, maintenance of boats and equipment, training of crews, and setting up and running remote field camps. Sherrie also participated in stream rehabilitation projects that involved restoration and enhancement of spawning streams. Specific projects on which Sherrie participated as a field supervisor and technician include coded wire tagging, mark and recapture, weirs, and fish sampling in multiple watersheds in Alaska.

Sherrie serves as the project biologist for activities related to habitat restoration sites in the Commencement Bay Watershed. She is the field team leader for monitoring projects performed at restoration sites in the bay and its watershed. The monitoring evaluates juvenile salmonid use and estuarine fish species richness at restored sites. The project involves beach seining, block netting, species identification, identifying hatchery and wild salmonids by tag detection and visual marks, database control, and reporting. Sherrie has also snorkeled and ran a minnow trap line on Hylebos Creek to determine species richness for use as a baseline for the new Jordan restoration site.

Sherrie served as the project biologist and field team leader for a fish monitoring project at the Seattle Aquarium, Pier 59. Sherrie performed snorkel surveys around and under the aquarium to determine the presence or absence of juvenile salmonids. The snorkel survey supported permitting applications for aquarium upgrades. Sherrie also completed the final monitoring report.

B.S., Environmental Sciences and Marine Biology, Huxley College of Environmental Sciences, Western Washington University.

Answers to Gary Rule's questions about the Year 5 ESA Scientific Research Permit

From: Gary Rule [mailto:Gary.Rule@noaa.gov]
Sent: Tuesday, February 14, 2006 11:46 PM
To: 'Colin Wagoner'
Subject: ESA Scientific Research Permit

Gary Rule
Protected Resources Division
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Portland, OR 97232
PH: 503-230-5424
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Colin,
I have finished reviewing your application and I have a couple of questions. Please respond to each of the questions below.

1) When and if there are unintentional mortalities of Puget Sound Chinook salmon, what will happen to the dead fish? If you will not retain samples, state that samples will be returned to their capture site. If you are going to retain these fish, either in a museum or other institution for the continued benefit to science, include information on where the samples will be stored, transferred, and how/when/where they will be disposed. Include the list of researchers, laboratories, museums, and/or institutional collections that would receive these tissue samples or specimens. Please include name, address, contact, and phone number for each.

2) The take table has one row with "unknown" as the origin. What did you mean by "unknown"? I can not determine the effects of the take if the origin is "unknown". The origin must be either naturally produced or artificially propagated. You will have to add these fish to one of the other origin types.

3) Using the exact numbers from Year 3 as the 'Requested Number of Fish to be Taken' could result in complications during the field season. For example, if you reach this limit early, you will have to request a modification to your permit and your research will be delayed. I suggest that you round your numbers up slightly to allow for fluctuations in both hatchery and natural production.

4) What was the mortality rate during the Year 3 monitoring season? Using an assumed mortality of 3% is fine, but we need to include

information about the results of the Year 3 monitoring.

Answers:

1) All unintentional mortalities of Puget Sound Chinook salmon will be returned to their capture site.

2) The "Unknown" origin row shows Chinook that were released before being checked for marks. Because the majority of the Chinook salmon that we sample are hatchery fish, we will assume any Chinook salmon that are not checked for marks to be artificially propagated. See Table 1 below.

3) The requested number of fish to be taken has been modified. See Table 1 below.

4) A total of 613 juvenile Puget Sound Chinook salmon were caught and sampled during the Year 3 monitoring season. Of those 613 Chinook, 76 were naturally produced and 537 were artificially propagated. Assuming a 3% mortality rate, a total of 18 unintentional mortalities occurred in the Year 3 monitoring season. No fish were observed to die during the 2004 monitoring program so the quantity 18 represents an estimate of fish that may have died after they were identified and released. Of those 18 unintentional mortalities, 2 were naturally produced Chinook and 18 were artificially propagated Chinook. All unintentional mortalities were returned to their capture site.

Table 1 (Revised). Estimated annual take and mortality for the listed ESU Puget Sound juvenile Chinook salmon (*Oncorhynchus tshawytscha*) for 2006-2010.

ESU/Species	Origin	Life Stage	Take Activity	Requested Number Fish to be Taken	Requested Authorized Unintentional Mortality	Research Location	Research Period
Puget Sound Chinook salmon	wild	Juvenile	Capture, handle, release	200	6	Commencement Bay and Tributaries	March - August
Puget Sound Chinook salmon	hatchery	Juvenile	Capture, handle, release	800	24	Commencement Bay and Tributaries	March - August
Total Chinook				**1000**	**30**		